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CARCINOMA OF THE CARDIAC PORTION OF THE STOMACH*

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Carcinoma of the stomach is considered to be a disease of the civilized world, but this is rather difficult to prove, as we are lacking accurate statistical data concerning the incidence of carcinoma of the stomach in so-called uncivilized peoples. No race is exempt from carcinoma. There appears to be no significant difference in cancer incidence between the white and negro race in the United States, according to Cramer.

There is some statistical evidence that the total mortality from carcinoma in about ten different European countries per 100,000 population is about the same, but in England the incidence of carcinoma of the stomach is only half as great as in continental European countries.

There is no occupational trend in the incidence of this disease. Stevenson studied the incidence of carcinoma of the gastro-intestinal tract in regard to the social status of English patients. According to this study, the incidence of carcinoma of the upper part of the digestive tract increases rapidly with descent in the social scale, whereas the incidence is almost the same in all social classes as far as the lower part of the digestive tract is concerned. On the other hand, Hoffman demonstrated in his extensive statistical material based on the data of the insurance companies that the incidence of cancer in general is higher among prosperous, well-to-do people than among industrial workers.

There is an apparent increase in the incidence of carcinoma of the stomach. This increase may be ascribed to the following factors:

1. Improved methods of diagnosis of cancer.
2. More accurate statistical data on morbidity and mortality of cancer.
3. An increase in longevity of people—i.e., more people are reaching the age at which cancer is more frequently encountered.

The progress in earlier recognition of cancer is by no means satisfactory and much will have to be done to increase the early diagnosis. The employment of mass radiographic methods for the diagnosis of carcinoma of the stomach has been attempted but the scope is far beyond our present means both in respect to equipment and trained personnel. It is still the acuity of the clinician who gives a lead in suspecting a neoplasm which will bring the patient for an examination. And it is still primarily the responsibility of the radiologist to establish the diagnosis of a gastric neoplasm or to exclude its presence.

The symptomatology of cancer of the stomach is vague, particularly in the early stage of the disease. The symptoms are mainly determined by the site of the new growth and the extent of the lesion. The degree of impairment of motor function of the upper part of the digestive tract accounts for one of the important signs which will bring the patient for an examination. A lesion at the pyloric end of the stomach will give different symptoms from a lesion at the cardia. On the other hand, a lesion in the body of the stomach may remain entirely asymptomatic, until secondary anemia, loss of weight and strength become so obvious that the diagnosis may be established on sight of the patient. Not infrequently, carcinoma may masquerade as an ulcer both clinically and radiologically.

In the radiological study of gastric neoplasms we are mainly concerned with gross morbid anatomical changes. Three main groups can thus be identified: (a) the polypoid, (b) the ulcerating, and (c) the infiltrating carcinoma. The gross pathological appearance has no relationship to the microscopic findings. Very often there is a transition from one gross type of lesion to another and this does not necessarily indicate that the tumour progresses from one stage to another in its growth.

Konjetsny evolved the following classification for gastric carcinoma which is based on the classification of Mikulicz and Borrmann:

1. The mushroomed or polypoid form which grows into the lumen of the stomach.
2. The ulcerating dish-like carcinoma with clearly defined walls and sharp borders.

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3. The ulcerating carcinoma with poorly defined walls and indistinct borders, infiltrating the gastric mucosa beyond the ulcer wall.
4. The diffuse carcinoma which spreads from the pylorus towards the cardia and causes thickening of the gastric wall. In this group we find:
   (a) Linitis plastica.
   (b) The fibrosing carcinoma which is similar to linitis plastica but involves only a portion of the stomach, usually the antrum.
   (c) Another diffuse carcinoma in which the mucosa, instead of being obliterated, simulates hypertrophic gastritis.

Lesions in the cardia are very difficult to identify. Carcinomas in this region frequently encroach upon the lower end of the esophagus and in advanced stages the symptoms are more those of an obstruction of the lower end of the esophagus than of a gastric neoplasm. Quite often the tumour can be outlined against the gas bubble in the stomach. The flow of the barium column advancing into the stomach from the esophagus may be split into two or several small streams. This is best seen with the patient in upright position. In recumbent position or with a large amount of barium, the lesion becomes obscured and its contour, which is outlined against the gas containing stomach with or without the coat of barium adhering to the surface of the tumour, may be easily lost.

In far advanced lesions of this region, once the folds are obliterated, the diagnosis may be rather difficult to establish unless obstructive signs at the lower end of the esophagus draw the attention of the examiner towards the lesion.

There was a time when increased distance between the abdominal surface of the diaphragm and the fundus of the stomach was thought to be pathognomonic of neoplastic lesions of the fundus. This increased distance may be caused by the interposition of the left lobe of the liver or interposition of the spleen between the stomach and the left leaf of the diaphragm, or by projection of the fundus towards the posterior surface of the left leaf of the diaphragm so that the fundus is seen some distance from the dome of the diaphragm.

Among the methods employed in visualization of the tumours of the fundus region is air insufflation by means of a Levine tube under fluoroscopic control or the use of Seidlitz powder to distend the stomach with CO_2. This method is used by Wash and Epstein[5] who find it satisfactory.

Stewart and Illick[3] follow the flow of the first swallow of liquid barium as it enters the stomach. The delay in the flow of barium through the lower end of the esophagus, the splitting of the barium column as mentioned above, the distortion of the rugal pattern, the deformity of the gastric gas bubble and occasionally the outline of the tumour mass against the contrasting air in the stomach are often pathognomonic. The importance of an empty stomach for this examination is stressed by Kirklin[2], as the pressure of fluid obscures completely the tumour in the fundus region. Kirklin[1] also stresses the fact that examination in recumbent position may obscure the tumour.

Extraneous shadows may be projected into the gas filled fundus region of the stomach and simulate gastric tumours. Thus a deformed spine, an aneurysm of the upper part of the abdominal aorta, a retroperitoneal tumour (kidney, tail of pancreas), may become projected into the gastric air bubble, but careful fluoroscopic examination will enable proper interpretation of these shadows.

The importance of an early and correct roentgenological diagnosis has become even more important in recent years since these tumours can be successfully operated upon by transthoracic approach. Until about 1942, the approach was mainly abdominal and a total gastrectomy with esophago-jejunal anastomosis was the method of choice in treatment of tumours of the fundus of the cardiac portion of the stomach. More recently Churchill and Sweet,[6 7] approached the lesion through the thoracic cavity by resecting the ninth rib, opening the left of the diaphragm, severing the esophagus above the point of involvement and anastomosing the stump of the stomach with the remaining portion of the esophagus, bringing the stomach into the thoracic cavity. This method is now employed in all lesions of the cardia, and it is of paramount importance to establish preoperatively the exact site of the lesion, its size and extension as they are the determining factors which decide the method of approach.

The radiological examination of the upper portion of the stomach is difficult as this part of the stomach is not accessible to direct palpation and pressure. The importance of direct fluoroscopic observation and fluorographic studies is even greater than in the body and antrum as they can be easily palpated. Very often the picture will change in the course of the examination as the increased amount of gastric fluid due to hypersecretion may wash off the thin coat of barium from the surface of the mucosa of the fundus and thus remove the only trace of positive evidence of a tumour. There is no doubt that a polypoid or ulcerating tumour can be more easily detected than an infiltrating lesion, as the mucosal pattern in the fundus region is quite variable and very often may not provide sufficient evidence to make a diagnosis of an infiltrating tumour possible.

In reviewing more recent reports on operability and resectability of gastric carcinoma, one

impressed by the very marked improvement in the surgical techniques over the period of the past ten years. Wangenstein and his associates reported that in 1936 the operability and resectability were 57 and 28% respectively. In 1945 these rates were 88 and 80%. The mortality rate for partial gastric resection was 25% in 1936 and 4.9% in 1945.

R. H. Sweet[7] in reporting on the management of carcinoma of the esophagus and cardiac end of the stomach, recently reviewed 213 cases which were operated on between 1939 and Jan. 1st, 1947. Of these, 141 had the lesion in the lower end of the esophagus and cardiac portion of the stomach. 50 of these were found inoperable. 91, or 64.5% have undergone resection; 12 died following the operation. 79 survived. 30 of these lived from 6 months to 7 years. It is interesting to note that the survival curve levels off 2 years after the operation and remains on the same level thereafter.

What steps can be taken to make earlier diagnosis possible and thus increase the number of cures of patients with gastric carcinoma ?

In the University of Minnesota, a Pilot Cancer Detection Clinic has been in operation for the past few years, the purpose of the Clinic being to detect gastric cancer in its earliest stage.

Kirklin and Gilbertson reviewed[1] in 1947, 68 cases of carcinoma of the cardiac portion of the stomach which were seen in the Mayo Clinic during the year 1945. Of these, 35 cases, or approximately 50%, showed evidence of a tumour shadow projected into the gas-filled cardiac portion in the erect chest film. The recent years have brought mass chest radiography into a very great use. This may offer a very important diagnostic medium for exploration of the cardiac region of the stomach with perhaps only very slight modification of the technical factors used in the chest radiography. But careful study of the gas shadow in the left subdiaphragmatic region in every routine chest examination is of great importance, particularly in the age group over fifty.

In the following roentgenograms, eight cases of carcinoma of the cardiac portion of the stomach are illustrated. Seven of these cases show a definite deformity of the gastric gas shadow, which is significant if not entirely diagnostic. In Case 6, the lesion was suspected on routine chest investigation but was overlooked during examination of the stomach, only to be found during a laparatomy for cholecystitis. Subsequently the tumour was resected via transthoracic route. The eighth is a case of a carcinoma in a herniated cardiac portion of the stomach.

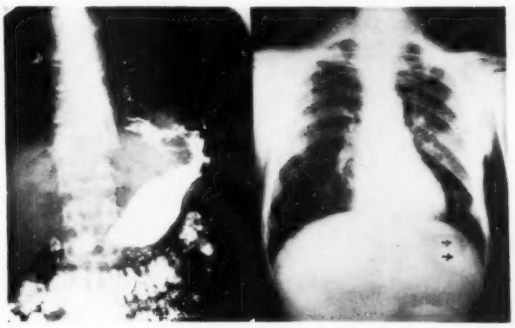

Fig. 1—P.Z.60 yrs. ♂

A. Extensive neoplastic involvement of cardia and upper one-third of the stomach.

B. Lesion outlined in the gas bubble of the stomach.

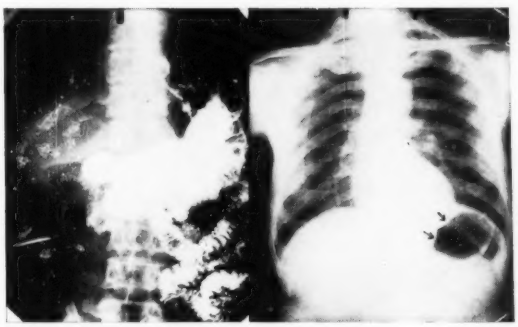

Fig. 2—J.D.71 yrs. ♂.

A. Ulcerating carcinoma of lower end of esophagus and upper portion of the stomach.

B. Lesion projecting from lesser curvature side towards the gas filled cardiac portion of the stomach.

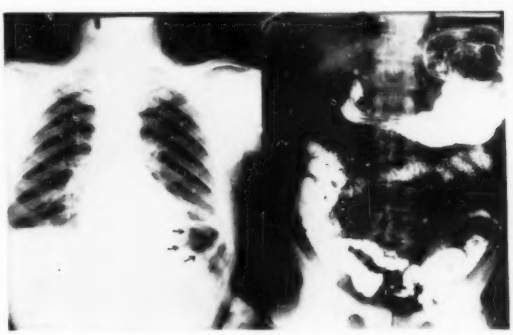

Fig. 3—S.J.63 yrs. ♂.

A. Tumour mass projecting into the gas bubble of the cardiac portion of the stomach.

B. Extensive cauliflower mass coated with barium in the cardiac region.

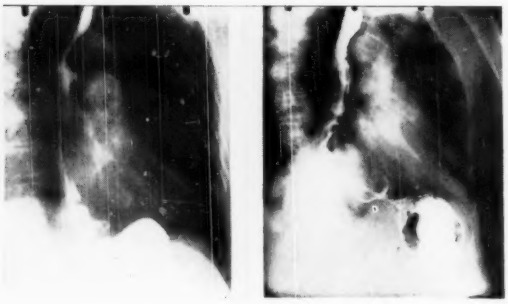

Fig. 4—B.F.71 yrs. ♂.

A. Hiatus hernia.

B. Large carcinomatous lesion in herniated portion of the stomach.

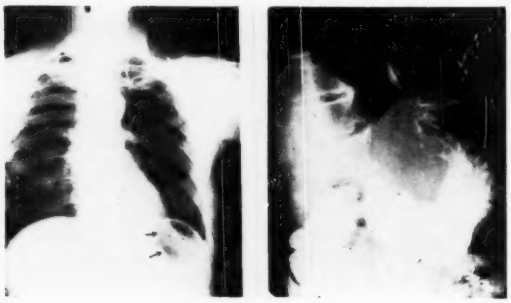

Fig. 5—M.K.67 yrs. ♂.

A. Polycyclic tumour projecting into the cardia.

B. Extensive carcinoma involving the cardia (transthoracic resection).

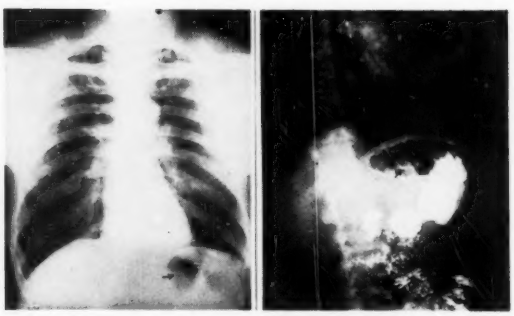

Fig. 6—P.J.55 yrs. ♂.

A. Tumour outlined against the contrasting air in the cardia. Discovered on routine chest examination.

B. Small lesion in cardia (arrows) (transthoracic resection).

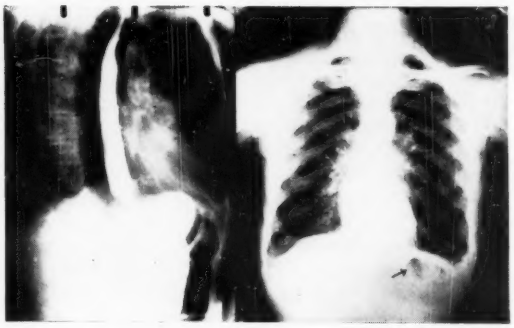

Fig. 7—L.L.60 yrs. ♂.

A. Small lesion outlined in the cardia (barium).

B. Same lesion in routine chest view.

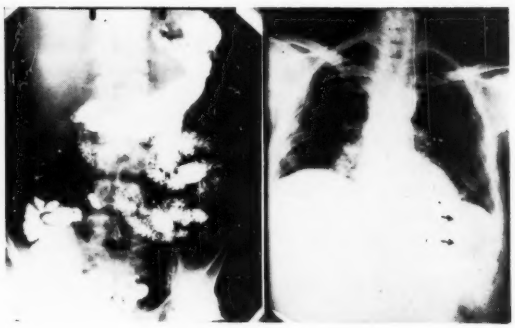

Fig. 8—B.C.48 yrs. ♂.

A. Large mass in cardia extending along lesser curvature side.

B. Mass visible in the gas filled cardia during chest examination.

SUMMARY.

The subject of cancer of the upper portion of the stomach is of great importance to the clinician and radiologist.

These lesions remain silent for a long time and give rise to obstructive symptoms only when they are well advanced. Whereas cancer of the remainder of the stomach is more accessible to palpation, the lesions in the upper part of the stomach are hidden behind the lower ribs and therefore cannot be well visualized.

With the advent of the surgical transthoracic approach for this type of lesion, early and correct radiological diagnosis is even more important.

Eight cases demonstrating lesions in the upper part of the stomach are presented.

RESUME

Le cancer de la partie supérieure de l'estomac (fornix) constitue une question importante pour le clinicien et le radiologiste.

Les lésions de la grosse tubérosité de l'estomac passent longtemps inaperçues; elles ne se manifestent par des symptômes d'obstruction que lorsqu'elles ont atteint un stade avancé.

Tandis que le cancer du reste de l'estomac (corps est accessible à la palpation, les lésions de la portion supérieure de l'estomac (grosse tubérosité) sont cachées derrière les dernières côtes et par conséquent ne peuvent pas être facilement reconnues.

La possibilité d'accéder à ces lésions, par une technique chirurgicale trans-thoracique, rend le diagnostic radiologique précoce et exact, d'une importance encore plus grande.

Nous présentons huit cas de lésions de la portion supérieure de l'estomac.

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1950 ANNUAL MEETING

HALIFAX, N.S.

The schedule for the Executive Council and Annual General meetings of the Canadian Association of Radiologists has been established and is as follows:

Monday, June 19th:

9:00 A.M., Executive Meeting.

2:00 P.M., Council Meeting.

Tuesday, June 20th:

9:00 A.M., Council Meeting (if necessary).

2:00 P.M., Annual General Meeting.

7:00 P.M., Annual Dinner. (To be confirmed at Annual Meeting.)

If you have not done so, you are reminded to make your hotel reservation immediately.

All meetings will be held at the Nova Scotian Hotel, Salons B and C, Halifax

L'ANGIOGRAPHIE CEREBRALE *

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L'angiographie cérébrale prend de plus en plus d'importance en neurologie. Ceci est dû au fait qu'elle augmente grandement nos possibilités de diagnostic et solutionne ainsi de nombreux problèmes neurologiques et neurochirurgicaux.

Une preuve de son importance capitale est la récente attribution du Prix Nobel de Médecine 1949 à Egas Moniz, qui préconisa dès 1927 l'injection de substance opaque aux Rayons-X dans la carotide primitive, pour le dépistage des lésions vasculaires et la localisation des tumeurs cérébrales.

Près de la moitié des communications du congrès de neuroradiologie de Rotterdam en septembre 1949 portèrent sur l'angiographie cérébrale.

Tous les aspects de la question y furent envisagés, laissant ainsi loin en arrière toutes les autres préoccupations des radiologistes dans le diagnostic neurologique.

Moniz injectait sa substance après dissection de l'artère. La voie per-cutanée a contribué largement à diffuser cette méthode d'examen et à la rendre possible chex un plus grand nombre de malades.

Substances de Contraste

Le Diodrast à 35% est la substance de contraste que nous employons à l'Hôpital Notre-Dame. Je me suis toujours opposé à l'emploi du Thorotrast à cause de sa radioactivité reconnue, pouvant amener des accidents tardifs hépatiques ou autres.

Même ceux qui vantent la valeur de ce moyen de contraste reconnaissent qu'il ne faut pas l'injecter sans dissection de l'artère, parce que l'injection dans les tissus mous péri-artériels constitue également un danger d'accidents éloignés.

Il faut reconnaître au Thorotrast qu'il n'est pas irritant pour l'endartère et qu'alors il ne provoque pas de spasme vasculaire, ni de douleur au moment de l'injection.

Il offrirait encore l'avantage d'une plus grande densité ou meilleur contraste de l'image radiologique, ce qui n'est pas certain, car, à mon avis, la densité de l'image vasculaire dépend du calibre de l'aiguille employée et de la vitesse de l'injection.

Le Diodrast n'est pas lui-même sans danger possible. Ollson de Lund a démontré par ses expériences sur des lapins que le Diodrast ou les autres substances du même genre provoquaient une perméabilité de la paroi vasculaire au Trypan Bleu. Cettepermé abilité expliquerait la formation d'un oedème cérébral chez l'homme. C'est cet oedème cérébral qui constitue le danger de l'artériographie cérébrale et en particulier chez les malades souffrant déjà d'une forte hypertension intra-crânienne.

L'augmentation subite d'une pression déjà forte peut provoquer une hernie du lobe temporal ou une hernie des amygdales cérébelleuses et amène la mort sur le champ. Nous n'avons jamais eu d'accident de la sorte, mais il est bon d'en connaître la possibilité pour pouvoir la prévenir.

Je n'ai même pas relevé les incidents survenus chez nous, car ils ont tous été insignifiants.

Une malade s'est plainte d'engourdissements des doigts après 3 injections. Plusieurs accusent de fortes douleurs ou sensation de brûlures de l'oeil ou de la face, si l'angiographie n'est pas faite sous anesthésie générale.

Nous avons l'impression qu'une bonne prémédication au Démérol et une anesthésie générale au Pentothal ont prévenu chez nous tous les accidents possibles.

Le professeur Masy de Louvain a présenté à Rotterdam une substance colloïdale, le Diiodostéarate d'Ethyle. Cette substance étant de nature colloïdale comme le Thorotrast en offre tous les avantages sans être radioactive. Cette qualité de non radioactivité sera sûrement capable d'amener l'adhésion de tous et je pense que nous devrions tous l'essayer si l'occasion nous en est fournie.

Cependant, Lindgren a démontré que le Thorotrast avait été responsable de petites embolies dans les artérioles cérébrales. Et je me demande si le Diiodostéorate d'Ethyle, à cause de la grosseur de ses micelles ne pourrait pas causer les mêmes accidents.

Pour moi, l'avantage suprême du Diodrast est son taux excessivement rapide d'élimination. Après quelques heures, l'organisme en est débarrassé complètement.

Indications.

L'artériographie met en évidence certaines anomalies vasculaires telles que les anévrysmes artériels et les anévrysmes artério-veineux.

En plus d'en permettre le diagnostic, elle localise parfaitement ces lésions et en facilite

* Travail lu à la réunion d'hiver de l'Association Canadienne des Radiologistes, janvier 1950.

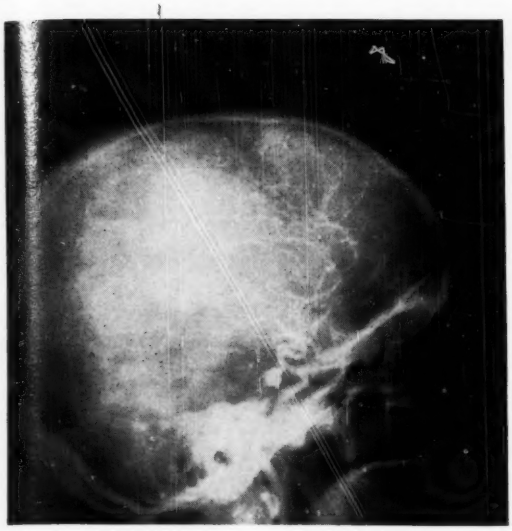

Fig. 1—Anévrysme carotide interne

grandement le traitement chirurgical, s'il y a lieu. (Fig. 1).

Il est toujours de mise d'étudier la circulation cérébrale provenant de chaque carotide interne dans les cas d'anévrysme, pour établir s'il n'y en a pas de multiples.

La compression de la carotide du côté malade pendant l'injection du côté sain, fera connaître dans quelle mesure la ligature d'une carotide interne entravera la circulation cérébrale de ce côté.

L'étendue et l'irrigation des anévrysmes artério-veineux sont très bien établies par une injection bilatérale recommandable dans tous les cas.

Le diagnostic de thrombose ou d'embolie cérébrale peut désormais être vérifié anatomiquement. Bien plus, l'étendue des dégâts peut être estimée, car la localisation de l'artère oblitérée est faite en même temps que le diagnostic d'oblitération. (Fig. 2).

Je ne crois pas que cette méthode d'examen remplacera un jour l'encéphalographie gazeuse ou la ventriculographie dans le diagnostic des lésions expansives intracrâniennes, mais c'est mon opinion que l'angiographie sera employée d'une façon aussi extensive que ces deux premières méthodes plus anciennes.

Une bonne raison à cela, c'est que l'angiographie est beaucoup mieux supportée par les patients.

Les docteurs Claude Bertrand et André Parenteau (ou leurs assistants) qui font eux-mêmes les injections en sont personnellement convaincus. Le Docteur Bertrand est d'ailleurs responsable de l'emploi intensif de l'artériographie chez-nous. Il a introduit la méthode à

Fig. 2—Thrombose carotide interne.

l'Hôpital Notre-Dame et sur ses conseils je m'y suis intéressé.

James Bull de Londres emploie l'angiographie de préférence à la pneumographie dans les cas de tumeurs cérébrales, toutes les fois qu'il y a des signes certains de latéralisation. Ces signes de latéralisation peuvent être d'ordre clinique comme une hémiplégie ou une aphasie et d'ordre radiologique comme le décalage latéral d'une glande pinéale calcifiée ou la présence d'une lésion calcifiée.

Les déplacements vasculaires nous permettent de localiser les lésions expansives aussi bien que les déplacements ventriculaires dans le pneumogramme.

Dans certains cas, l'artériogramme surpasse le pneumogramme. En fait, ces deux méthodes d'examen ne doivent pas entrer en compétition. Elles doivent plutôt se compléter l'une l'autre.

Tantôt le pneumogramme suffira à régler un problème, tantôt nous demanderons à l'angiographie de venir à notre secours et très souvent les deux examens seront nécessaires pour obtenir le maximum de renseignements pré-opératoires.

Il est possible de faire un diagnostic certain d'hématome sousdural par l'artériographie. L'image radiologique est aussi caractéristique que celle d'un néoplasme circulaire du côlon ou que la niche ulcéreuse du bulbe. Un film en A.P. est cependant nécessaire pour cela. Jamais des stéréoradiographies en latéral ne pourront faire porter un tel diagnostic.

Sur le film A.P. les petits vaisseaux corticaux sont éloignés de la table interne du crâne et l'on a habituellement une image lacunaire concave ou une absence de vascularisation à cause du refoulement du cerveau occasionné par l'hématôme. (Fig. 3)

Fig. 3—Hématôme sousdural.

Ce diagnostic peut être porté également au cours d'une encéphalographie, mais beaucoup plus rarement et d'une façon beaucoup moins spectaculaire. En effet, les espaces sous-arachnoidiens injectés peuvent être refoulés de la table interne par la couche de tissu mou que représente l'hématôme.

Cette image peut passer inaperçue plus facilement parce que le contraste est moins grand qu'avec l'artériographie.

Pour ce qui est des tumeurs, des abcès ou des hématômes intracérébraux, ces lésions sont d'autant plus faciles à localiser qu'elles sont rapprochées des vaisseaux principaux.

Aussi, il ne faudra jamais compter sur l'artériographie, si l'on soupçonne une tumeur de la fosse postérieure. Seule la ventriculographie est indiquée dans ce cas. Quant aux lésions des hémisphères cérébraux, les tumeurs occipitales sont très faciles à manquer par l'angiographie. James Bull et Wickbom prétendent le contraire. Dans ma courte expérience cependant, toutes les tumeurs occipitales n'ont pas donné d'image angiographique alors même que nous savions qu'elles existaient.

Les autres localisations qui ne nous ont pas montré de déplacement vasculaire, sont certaines tumeurs pré-frontales. Les tumeurs frontales postérieures et pariétales ont toujours été parfaitement localisées même si elles étaient para-médianes. Malgré les dires de Wickbom et Bull qui ont constaté qu'à cause de la fixité relative des artères péri-calleuses et calloso-marginales, il était possible que 50% des tumeurs para-médianes puissent être manquées.

Pour nous la lésion de choix de l'angiographie, c'est la lésion expansive temporale ou sous-sylvienne. Le relèvement du groupe sylvien sur les clichés de face comme sur ceux de profil est assez frappant, même pour un débutant.

Dans les lésions centrales, les lésions du 3e ventricule ou de la base, comme le crâniopharyngiôme et l'adénône hypophysaire, il est évident que l'artériogramme cède le pas au pneumogramme. La plus belle victoire de l'angiographie est la localisation précise d'une tumeur hémisphérique alors que le pneumogramme en est incapable à cause d'un affaissement ventriculaire.

Il faudrait ici parler avec chiffres en mains, mais l'espace me manquant, je compte bien exposer mes statistiques dans un autre article.

En plus d'aider à la localisation des lésions expansives, l'artériographie peut parfois en déterminer la nature.

En effet, un certain nombre de tumeurs ont une vascularisation propre qui peut être très intense et qui peut se traduire par une image caractéristique. Ainsi, si l'on aperçoit une tumeur vascularisée et si l'on peut démontrer que cette tumeur reçoit une partie du moins de son irrigation des branches de la carotide externe, la méningée moyenne par exemple, l'on est en droit de suggérer le diagnostic de méningiôme. L'on doit se souvenir qu'il peut s'agir d'une métastase. Par ailleurs, le méningiôme donne très souvent sur le phlébogramme une image d'une densité homogène, ce qui, je crois, n'arrive pas dans le cas de métastases.

Et si l'on a la chance d'injecter plusieurs tumeurs à la fois, il faudra porter alors le diagnostic de métastases.

La tumeur cérébrale la plus fréquente chez l'homme adulte est le glioblastôme multiforme. Une des caractéristiques histologiques de cette tumeur est la formation dans son sein, de néo-vaisseaux nombreux. Elle peut même être le siège de shunt artério-veineux.

Ces vaisseaux de néo-formation peuvent s'opacifier et donner des images assez particulières et pour cette raison suggérer fortement le diagnostic de tumeur au moins maligne. L'apparition de vaisseaux en "tire-bouchon" ("cork screw") nous suggère toujours le diagnostic de glioblastôme. (Fig. 4 et 5)

Quelquefois il s'agissait d'astroblastôme. Et alors, c'est mon avis, qu'il faut se tenir sur la réserve et parler de tumeur maligne.

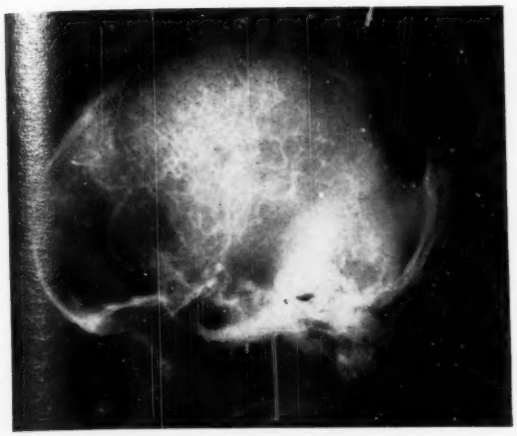

Fig. 4—Glioblastôme multiforme, frontal.

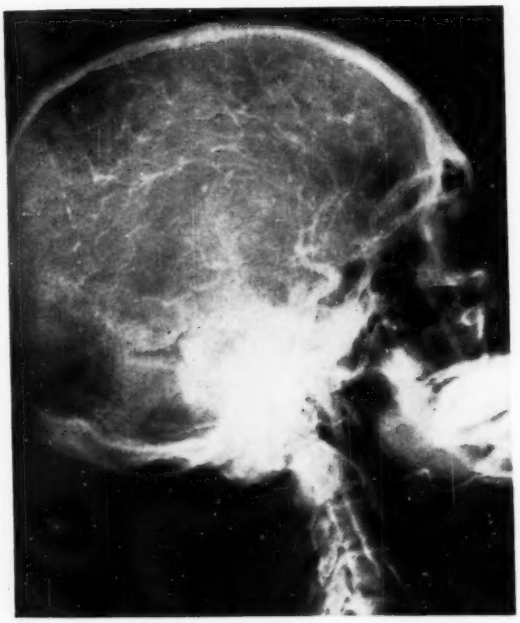

Fig. 5—Glioblastôme multiforme, temporal.

La présence d'un shunt artério-veineux, c'est-à-dire l'opacification de veines ou sinus sur le cliché de la phase artérielle, peut rendre le diagnostic différentiel difficile entre le glioblastôme et l'anévrysme artério-veineux. Dans cette dernière anomalie, l'hémorragie intra-cérébrale est toujours possible et peut être alors la cause de déplacement vasculaire ou ventriculaire.

Heureusement la plupart des anévrysmes artério-veineux présentent des caractéristiques évidentes.

La présence de " vaisseaux tumoraux " ("Tumor vessels") si elle n'est pas d'une valeur absolue pour le diagnostic de nature, nous est d'un grand secours pour la localisation des tumeurs puisqu'elle délimite exactement l'étendue de la tumeur, ce qui est presque impossible avec le pneumogramme.

Le pneumogramme ne donne jamais de localisation aussi précise que l'artériogramme dans le cas de tumeur vascularisée, même si l'on a affaire à une tumeur faisant saillie dans un ventricule, car cette saillie ne représente qu'une partie de la tumeur.

De plus, l'on peut avoir des vaisseaux qui entourent complètement une tumeur, un méningiôme par exemple. Les ventricules ne circonscriront jamais une tumeur comme peuvent le faire les vaisseaux certaines fois.

Enfin, il ne faut pas oublier, que l'angiographie a une très grande valeur négative, non pas tant alors pour la localisation que pour le diagnostic différentiel des lésions pouvant être des anomalies vasculaires ou des tumeurs.

Il nous est arrivé de faire des artériographies alors que la lésion était parfaitement localisée par des calcifications ou par le pneumogramme, pour éliminer l'anévrysme artério-veineux ou l'angiôme.

En terminant puis-je répéter que je n'ai pas voulu dans cet article prôner l'angiographie cérébrale au détriment de la pneumographie.

Au contraire, les deux méthodes, doivent souvent être utilisées chez un même individu. Il s'agit maintenant de décider laquelle des deux il faudra employer dans tel cas particulier.

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IODURON B : A WATER SOLUBLE CONTRAST MEDIUM FOR BRONCHOGRAPHY : PRELIMINARY REPORT

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Recently there has been an awakening of interest in water soluble contrast media for use in bronchography. This paper is a preliminary report on the use of one of these media, known commercially as Ioduron B.

The principal objection to iodized oil as a contrast medium for bronchography is that remnants of the oil persist in the lungs for months or even years, thereby interfering with subsequent diagnostic endeavours. When, for example, a right sided bronchogram has been performed it is usually necessary to wait at least six weeks before examining the left side, assuming that each examination includes a lateral film. It may be necessary to wait several months or a year or more between two examinations. Another objection to iodized oil is that there is some evidence to suggest that the oil acts as an irritant, causing damage to body tissues. (1), (2). A further disadvantage is that iodized oil does not mix with body secretions and therefore does not spread out on surfaces in a thin layer but remains in droplets. (1). This may lead to diagnostic errors.

Since 1931 many attempts have been made to develop water soluble contrast media which would have the advantage of rapid elimination by the body. One of the chief problems encountered was the fact that these media were very hypertonic when used in the necessary concentration. This hypertonicity caused irritation of body tissues. Two of the drugs which were produced are known commercially as Umbradil (1) and Visco-Rayopaque. (4). A third drug, known as Ioduron B, is the subject of this paper. As far as the author is able to determine, Ioduron B is a 30 per cent aqueous solution of morphaline salt of pyridone di-iodide compound containing 55 per cent iodine. (3).

This opaque substance is a viscous, water soluble material which is stable at room temperature. The manufacturer claims that it affords good contrast and is easily tolerated by the body. *It is very rapidly eliminated from the body* and this constitutes its main outstanding advantage. Elimination is by the kidneys, a contrast-filled bladder being observed 20 to 30 minutes after visualization of the bronchial tree. All of the contrast medium has usually gone from the lungs 3 to 4 hours after bronchography. No residue has been observed in the lungs after 12 hours. (1). For demonstration of fistulae and cavities dilution with normal saline is recommended. The solubility of the drug in water permits addition of any water soluble substance required for therapeutic purposes—for example, penicillin or streptomycin. While it is intended primarily for use in bronchography, Ioduron B is also available in various strengths for pyelography, venography, arteriography, arthrography, angiocardiography and cerebral angiography.

The author's experience with this drug is limited to bronchography and only a small series of cases has been compiled. This report is therefore in the strictest sense a preliminary report. Bronchography was carried out on four patients. One of these patients was examined twice within a three day period and a total of five bronchograms was therefore performed. Each examination was unilateral.

Technique

The technique employed will now be outlined. It differs from that used with iodized oil in one respect, namely, that much more time and effort is expended in preliminary anaesthesia. One half hour before bronchography the patient receives Nembutal gr. 1½ and codeine gr. 1 by mouth, also a hypodermic injection of atropine gr. 1/150. Local anaesthesia is carried out using 2 per cent Pontocaine. After the palate and pharynx have been sprayed a rubber catheter is introduced into the trachea by the intranasal route. Approximately 5 to 6 c.c. of Pontocaine are then injected directly into the bronchial tree through the catheter, the patient being carefully postured in order to direct the anaesthetic into the lobe or lobes to be examined.

On his arrival in the X-Ray Department the patient voids in order to facilitate later visualization of the bladder. He is then fluoroscoped to make sure that the tip of the catheter is in the main stem bronchus of the affected side. Ioduron B is then injected very slowly through the catheter, its progress being observed on the fluoroscopic screen. The drug can be used undiluted but if desired it can be diluted 25 per cent with normal saline. When diluted it flows more easily in the bronchi.

*Presented at the 13th Mid-Winter Meeting, Canadian Association of Radiologists, January, 1950.

The usual routine is to start introduction of the opaque material with the patient upright. During the injection the table is lowered and the patient's position altered in such a way as to fill the suspected lobe or lobes, filling being confirmed by fluoroscopy. Alternatively the patient can be kept in horizontal position throughout the injection. During fluoroscopy spot films are taken. Finally the patient is put upright and 14 x 17 inch films are taken at four foot distance in postero-anterior, oblique and lateral projections. After completion of the bronchography films of the abdomen are taken at 30 minutes and 1 hour to observe the arrival of opaque material in the bladder. A film of the chest is taken at 3 hours.

Results

No attempt will be made to describe in detail the results of each individual examination. The results did not vary significantly and it will therefore suffice to summarize them and present the radiographs of a representative case.

Ioduron B, although more viscous than Lipiodol, is easily handled. It requires longer preliminary warming. It flows easily in the bronchi and produces a satisfactorily opaque shadow even when diluted 25 per cent with normal saline. The rate of its elimination is extremely fast, the author's cases confirming the manufacturer's claims in this regard. Opaque material was clearly seen in the bladder at 30 minutes. In one instance clear visualization of renal pelves and calyces was obtained. The lungs were clear of opaque material at 3 hours. However, absorption was not in any one instance solely from the lungs, as some of the Ioduron B was coughed up and swallowed. Other authors have proven its complete absorption from the lungs in 3 hours. (3).

It immediately became apparent that Ioduron B is irritating to the bronchi. The cough reflex was set up when only a very small amount had been injected (about 3 c.c.). When the patient *did* cough the results were very striking as observed on the fluoroscopic screen. The opaque substance usually was coughed up "en masse" into the pharynx and then swallowed. This is in sharp contrast to Lipiodol which usually goes out into the alveoli when the patient coughs. Numerous films were obtained showing Ioduron B in the oesophagus, stomach and jejunum. Usually the most severe coughing took place after the spot films had been taken and before the taking of the 14 x 17 inch films. As a result, the latter films frequently showed only a small amount of the drug in the bronchi. Despite this difficulty with coughing it was possible on 3 occasions to introduce 10 to 20 c.c. of the drug into the bronchial tree. Each patient had a hemoptysis, varying from slight blood tinging of sputum to about half an ounce of frank blood.

In an attempt to overcome the bronchial irritation especial care was taken with preliminary anaesthesia. As much as 10 c.c. of Pontocaine was used and the usual time taken for anaesthesia was doubled. Particular attention was also paid to prolonged posturing of the patient. It was gratifying to note that the fifth bronchogram was carried out with considerably less difficulty than was encountered during the previous examinations.

It was hoped that a search of the literature would reveal information which would be helpful in overcoming these difficulties. This hope is justified. The chief contributor to the literature is F. K. Fischer of Zurich who has successfully performed bronchograms using Ioduron B and whose radiographs are of a high standard of excellence. (1), (2). In a personal communication he admits that he also at first found this drug to be irritating to the bronchi, but states that with increasing experience he learned to overcome the difficulty. (5). Fischer's technique differs from that of the author in two respects. Firstly, Fischer carries out anaesthesia on a tilting table, presumably in the fluoroscopic room. Secondly, he uses special catheters which are made in France and called Métras catheters. These catheters, which have radio-opaque heads, are made with diverse curvatures, adapted to the curves of the bronchial tree. For the lower lobes slightly curved or straight catheters are used; for middle lobes those with curves in one plane; for upper lobes those with curves in two planes. These catheters are said to permit the contrast medium to flow directly to the selected site. (2). Fischer has not mentioned hemoptysis either in his published papers or in his personal communication.

It is our intention to do a further series of bronchograms with Ioduron B, using the tilting table for Pontocaine anaesthesia. This is a time consuming procedure and has not been done previously because of the great demand made upon the fluoroscopic room by other examinations. The advisability of obtaining Métras catheters is being considered, although no difficulty has been experienced in directing this drug to the desired site using an ordinary rubber catheter. In the future fluoroscopy will be done with the patient horizontal throughout, as it is believed that this method gives the best results. Also, the final 14 x 17 inch films will be taken with the patient horizontal. Animal experimentation will be done to obtain further information regarding hemoptysis. Ioduron B will be introduced into the bronchi of a healthy guinea pig. The animal will then be killed and a microscopic study made of the bronchial mucosa. As controls, guinea pigs will be used which have had Lipiodol alone and Pontocaine alone injected into the bronchi.

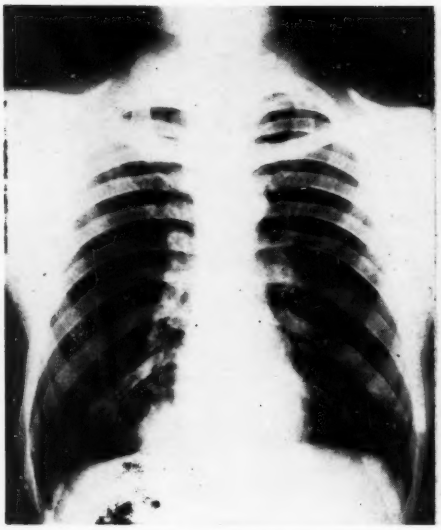

Fig. 1: Routine chest film taken before bronchography. Dense shadow in right cardiohepatic angle. Lateral film showed its position to be at lower end of main interlobar fissure. Etiology unknown, possibly an encysted effusion.

Fig. 2: Spot film taken during introduction of Ioduron B. Soon after this film was taken the patient coughed up and swallowed a large amount of the opaque material.

Figs. 3 & 4: 14 x 17 inch films taken at conclusion of fluoroscopy. A small amount of residual Ioduron B is seen in the bronchi.

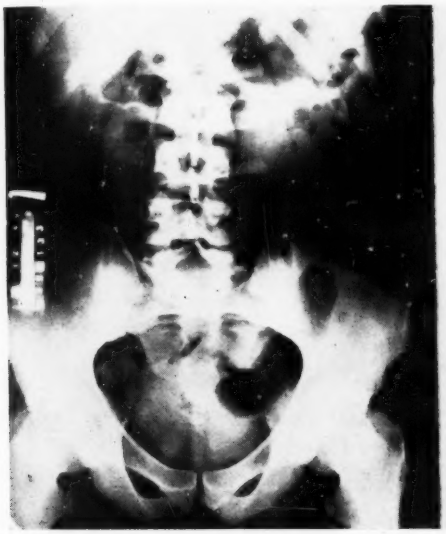

Fig. 5: The abdomen at 1 hour. Opaque material is present in the bladder and right lower ureter.

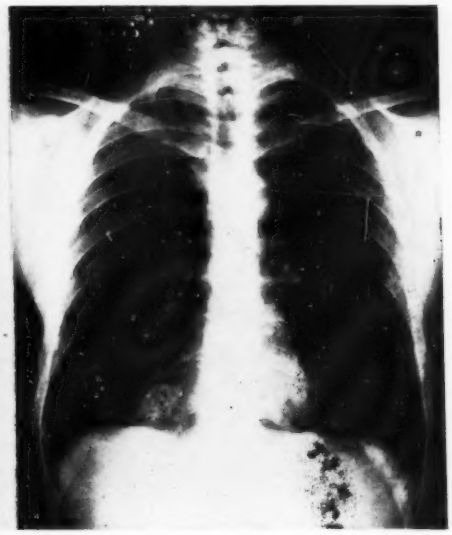

Fig. 6: The chest at 3 hours. No further coughing has occurred and all of the opaque material has left the bronchi.

Conclusions

(1) The disadvantages of the use of iodized oil as a contrast medium for bronchography have been discussed and the history of the development of water soluble opaque media outlined.

(2) One of the water soluble opaque media, known commercially as Ioduron B, has been fully described and a preliminary report given of its use in performing five bronchograms.

(3) Radiographs of a representative bronchogram have been presented.

(4) *Ioduron B has a tremendous advantage over iodized oil in that it clears from the lungs in 3 to 4 hours because of its water solubility*.

(5) This drug has the disadvantage of being irritating to the bronchi, thereby causing coughing. Attempts are being made to overcome this by more prolonged and painstaking preliminary anaesthesia. Slight hemoptysis has also proven to be a complication of the use of the drug. This is to be investigated by animal experiments.

(6) It is expected that, as further skill and experience are acquired, Ioduron B will prove to be a wholly satisfactory opaque medium for bronchography.

RÉSUMÉ

(1) Les désavantages de l'emploi d'un produit iodé soluble dans l'huile pour bronchographies furent discutés (controversés) de même que l'histoire du développement des substances opaques solubles dans l'eau (hydrosolubles).

(2) Une des substances opaques connue dans le commerce sous le nom de Ioduron B fut décrite en détails, de même qu'un rapport préliminaire de son emploi pour cinq bronchogrammes.

(3) Des clichés radiographiques d'un bronchogramme caractéristique furent présentés.

(4) L'Ioduron B comporte un très grand avantage sur l'huile iodée par le fait qu'il s'élimine des poumons en trois à quatre heures, à cause de sa solubilité dans l'eau.

(5) Cette substance cependant a le désavantage d'être irritante pour les bronches, occasionnant alors de la toux. Des efforts sont tentés pour obvier à cet inconvénient par une anesthésie préalable plus poussée. L'emploi de la substance a déjà même provoqué une légère hémotysie, laquelle complication devra être confirmée par des expériences chez l'animal.

(6) Avec plus d'expérience et une technique plus perfectionnée, l'on est en droit de s'attendre à ce que l'Ioduron B s'affirmera pleinement satisfaisant comme substance opaque à l'emploi de la bronchographie.

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UPPER ABDOMINAL PAIN IN PANCREATIC DISEASE *

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The symptom of upper abdominal pain is an indication for an X-Ray examination of the abdomen and abdominal contents. The method provides a high degree of accuracy in disclosing the common causes of such pain, be they gastric, duodenal, gall bladder or urinary tract disease.

Not frequently during the examination of the above organs, one discovers calcification in the region of the pancreas, with or without a mass displacing the adjacent viscera.

The purpose of this paper is to present five cases illustrating the radiological signs seen in disease of the pancreas. The emphasis is to be on pancreatic calcification as a sign of disease. The effect of pancreatic lithiasis on the prognosis will be discussed.

The incidence of pancreatic calcification is difficult to determine. Pascucci[1] quotes Ludin, who after a preliminary roentgenogram of the post-mortem pancreas, dissected all showing opaque shadows. Of 542 glands he found stones in 28—an incidence of 0.51%.

Domzalski[2] states that up to 1946 there were 243 cases of pancreatic lithiasis reported and of these 15% appeared in the literature of the last four years. Diffuse parenchymous calcification was reported only 20 times in this series and of these 50% were reported in the last four years.

Beling[3] in 1940 offered a distinction between diffuse calcification and pancreatic lithiasis. In the former the calcium is deposited in the parenchyma of the gland; in the latter the ducts contain single or multiple stones. There may be a combination of both types.

Aetiology.

The cause of pancreatic calcification is uncertain. The evidence points to repeated attacks of acute or sub-acute inflammation as the causative agent. A secondary factor, predisposing to recurrence, is stasis produced by obstruction of the ducts by calculi.

The scope of this paper does not extend to a discussion of theories of causes of pancreatitis.

* From the Department of Radiology, The Lontreal General Hospital, presented at the Midwinter Meeting of the Canadian Association of Radiologists, January 1950.

Pathology.

The following reports from the department of Pathology of The Montreal General Hospital illustrate the usual findings in pancreatic lithiasis. These cases were reported by Ackman and Ross[4].

"The pancreas was buried in dense fibrous tissue and was very much atrophied. On palpation the pancreas was hard and fibrotic. Along the course of the duct of Wirsung several large stones could be felt. Gross section of the gland showed the duct to be widely dilated and filled with numerous greyish white stones of various sizes and shapes. In addition to stones the ducts contained yellowish gummous material and sand-like particles. The duct walls were all greatly thickened and the parenchyma almost entirely replaced by fibrous tissue. Chemical analysis of the stones showed the chief constituent to be calcium carbonate with smaller amounts of calcium phosphate."

Microscopic examination of the pancreas:—"Many sections taken from various parts of the gland showed moderate loss of glandular tissue with extensive replacement fibrosis. In some areas the latter contained considerable round cell infiltration. What acinar tissue remained was present only in small islands. In none of the many sections could normal or even nearly normal Islets of Langerhans be recognized, but here and there, embedded in fibrous tissue, indistinct remnants of these were seen. There was considerable peri-pancreatic inflammatory connective tissue which involved also the adjacent lymphnodes."

We have been unable to find reports in the literature of the pathological changes associated with disseminated pancreatic calcification. We have no reason to believe that it presents a different picture.

Two of our cases were associated with pancreatic cysts. Pascucci[1] discusses the relationship of cysts and lithiasis in pancreatic disease. He found no experimental evidence that obstruction of the ducts or acini is responsible for the formation of cysts. He believes that a common pathological disturbance is the precursor of pancreatic lithiasis and cyst formation.

Symptomatology.

The outstanding symptom is abdominal pain, present for months or years. It is usually

epigastric but may radiate through to the back and rarely to either shoulder.

Wirts and Snape[5] state that steatorrhoea is present in 25% of cases. Diabetes may be present, and was present in two of our cases. A history of excessive indulgence in alcohol was obtained in two of our cases.

Laboratory Findings.

Pancreatic insufficiency may show itself as an endocrine insufficiency, diabetes, or as an exocrine deficiency with steatorrhoea. Metabolic disturbances may occur:—serum amylase elevation in an acute attack, or urinary diastase elevation. In sub-acute attacks these are usually within normal limits.

Case 1.

A.C. was a 44 year-old man, complaining of right-sided abdominal pain for 8 years, diarrhaea with loose yellow smelly stools. At a previous admission to a mental hospital for alcoholism he was found to be diabetic.

Physical examination was inconclusive. Laboratory tests, including urinary diastase and serum amylase were normal. X-Ray examination showed no evidence of disease of the gall bladder; intravenous pyelography was negative except that multiple calculi in the region of the pancreas were observed. A barium meal showed normal gastric mucosa. The duodenal mucosa was slightly coarsened, the stomach was displaced anteriorly and the duodenal loop enlarged. There was coarsening of the small bowel pattern with some segmentation. (Fig. 4). Pancreatic disease with cyst formation was diagnosed.

At operation the diagnosis of pancreatic cyst was confirmed and the cyst marsupialized. The cyst had a hyalinized connective tissue wall and its fluid contained trypsin. The pancreas itself was found to be hard, fibrosed, without visible pancreatic tissue and "about the size of a cigar".

Case 2.

P.D. is a 31 year-old tool grinder turned bartender, and exposed to the hazards of that occupation. He complained of nagging epigastric pain for 9 weeks and 40 lbs weight loss in 9 weeks. Physical examination showed only moderate tenderness in the epigastrium.

Laboratory examination showed an elevated urine diastase to 50 units per c.c., serum amylase not elevated. A gall bladder series and intravenous pyelography were negative. Pancreatic calculi were seen. (Fig. 1). A barium meal showed displacement of the stomach (Fig. 2) coarse mucosa, laking of the gastric mucosa and a lateral film showed the calculi to be within the mass posterior to the stomach. (Fig. 3)

A pancreatic cyst was diagnosed and this confirmed at operation. The cyst was marsupialized. Large calculi were found embedded in the pancreas and in addition there was a generalized calcinosis. The fluid of the cyst contained diastase and its wall was of connective tissue with a hyalinized lining.

There was some immediate relief of pain but the pain returned severely in a few weeks. A left thoraco-lumbar sympathectomy was carried out with marked relief of pain, on the theory that the cyst was not the chief cause of pain. Apparently the pain is associated with the presence of calculi and in pancreatic disease the presence of stones has some significance regarding prognosis.

Case 3.

J. L. was a 63 year-old man, giving a history of 3 months of crampy abdominal pain, not typical of ulcer pain. Laboratory investigation showed an elevated blood sugar, 151 fasting. Intravenous pyelography was normal; the gall bladder series showed no evidence of disease. Further X-ray examination showed displacement of the stomach upwards and anteriorly. The stomach was elongated and narrowed, the mucosa apparently normal. Pancreatic cyst formation was suspected.

At operation there was a large cyst of the pancreas. The cyst was drained and removed. The pain was relieved and subsequent x-ray examinations showed a normal appearing stomach.

The cyst fluid contained trypsin. The wall was of connective tissue with a hyalinized connective tissue lining.

Case 4.

G. D. was a 26 year-old mother who had nagging abdominal pain; was explored at another hospital and considered to have acute pancreatitis. The surgeon there found the pancreas swollen and edematous, with yellow nodules scattered through the omentum. On section these nodules were seen to be clusters of necrosed fat cells surrounded by macrophages.

On coming here on July 4th eight months later, she complained of abdominal pain, abdominal swelling, and 50 lbs weight loss in eight months.

Routine laboratory tests were normal. The urinary diastase was negative. Blood diastase was 15-25 units. The gall bladder was nonfunctioning; intravenous pyelography normal. A barium series disclosed a mass in the left upper quadrant, displacing the stomach, a normal mucosa, the stomach compressed and sliding on the mass, and dilated duodenum. (Fig. 5)

At operation a cyst of the pancreas was found. The fluid in the cyst contained amylase and lipase.

Case 5.

A. B. was a 35 year-old spinster, complaining of epigastric pain radiating to the back, vomiting and nausea. The attacks were intermittent.

Physical examination elicited deep tenderness but no palpable mass. X-Ray examination showed a normal functioning gall bladder and marked calcification and enlargement of the pancreas. The calculi were both large and small, and diffusely distributed.

Treatment.

The treatment is largely symptomatic and its object is the relief of pain. If cysts are present, marsupialization of the cysts may give relief.

If calculi are present, pain is apt to persist until the pancreas is destroyed. Pancreatectomy is associated with a huge morbidity. Relief of pain by division of the sympathetic pathways has been accomplished in one of our cases. The procedure has been outlined by Ray and Consoles[7]. The minimum operation consists of a resection of the nerve roots of Th. 11 to L. 1, and the lower eight centimeters of the greater splanchnic nerves.

Conclusion.

Pancreatic calculi are frequently associated with sub-acute or recurring acute pancreatitis. Many of these patients are diagnosed as psychoneurotic. The recognition of pancreatic calculi will lessen this error and will make possible a rational treatment.

The diagnosis of pancreatic lithiasis may be made by x-ray. The radiologist must think of the possibility and search diligently for calculi.

RÉSUMÉ

Les calculs pancréatiques sont fréquemment associés à la pancréatite subaigue ou récurrente aigue.

Plusieurs de ces patients sont étiquetés comme étant des psychonévrosés.

L'identification des calculs pancréatiques diminuera ces erreurs et permettra de faire un traitement rationnel.

Le diagnostic de la lithiase pancréatique peut être fait par les rayons X.

Le radiologiste doit penser à la possibilité des calculs et s'appliquer à les rechercher.

ILLUSTRATIONS

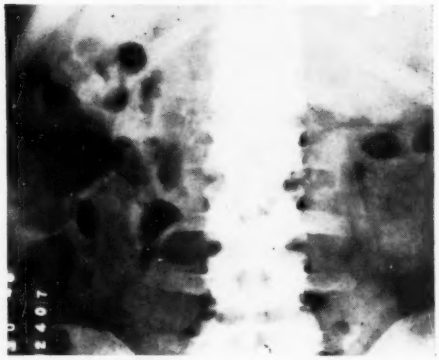

Fig. 1. Case 2. Pancreatic stones. At operation not only were the large stones identified, but a diffuse calcinosis was observed. The presence of large calculi is sufficient for a diagnosis of disease, the calcinosis may rarely be demonstrable radiologically.

Fig. 3. Case 2. Laking of the gastric mucosa, due to a relaxed stomach with a hypertrophic mycosa lying across a small mass.

Fig. 2. Case 2. A lateral supine of the barium-filled stomach, a useful procedure in demonstrating small degrees of pancreatic enlargement.

Fig. 4. Case 1. Coarsening of the mucosal pattern, widening of the duodenal loop and segmentation of barium in the small bowel.

Fig. 5. Case 4. Anterior displacement of the stomach and dilatation of the duodenum.

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NEW FUNDS AVAILABLE FOR RADIOLOGICAL RESEARCH*

The National Research Council announces the availability of funds for fundamental research in the field of radiology. This has been made possible by the James Picker Foundation, established in 1947 by Mr. Picker and his family. Capital funds of the Foundation now approximate $400,000.

The announced objectives of the James Picker Foundation are "to provide funds to foster research and broaden the scope of radiology."

For the year 1950, $15,000 from income will be available for research. In allocating these funds, special consideration will be given to fundamental work in radiology and its applied fields. The Foundation has specifically requested that none of its funds be used to subsidize the development of radiological equipment.

The National Research Council has been designated as the scientific advisory body of the Foundation. It is expected that applications will be considered by the Council's Committee on Radiology under the Chairmanship of Dr. Eugene P. Pendergrass. Final determination of the awards will be made by the Directors of the Foundation upon the recommendation of the National Research Council.

The Directors of the James Picker Foundation are: Harold E. Stassen (Chairman) — President, University of Pennsylvania; General George Doriot—Professor, Harvard University; Ivan Dresser—Vice-President, General Motors Overseas Corporation; Ross Golden, M.D.—Professor of Radiology, College of Physicians and Surgeons, Columbia University.

Applications for fellowships in the field of radiological research, with stipends of the order of $3,000 to $5,000, depending upon the qualifications and special circumstances of the applicant, will also be entertained.

Applications for research grants and fellowships available during the year beginning January 1, 1951, will be entertained until September 15, 1950, and are *NOT* limited to citizens of or laboratories in the United States.

Enquiries should be addressed to: Secretary, Division of Medical Sciences, National Research Council, 2101 Constitution Avenue, Washington 25, D.C.

* From The American Journal of Roentgenology and Radium Therapy, April 1950, Page 587.

POSITIONS AVAILABLE

Physicist Available

We have recently received request from Hospital Physicist regarding position available in Canadian Hospital. Any member interested should communicate immediately with the Honorary Secretary-Treasurer.

Public General Hospital, Chatham, Ontario,

150 bed General Hospital, with an active X-Ray Department, in a city with 22,000 population, also serving a large rural area. Apply to Central Office of the Canadian Association of Radiologists, for further details.

Vancouver General Hospital, Vancouver

Student for 3-year course in radiology. For further details, write: Dr. Bede J. Harrison, Director, Department of Radiology, The Vancouver General Hospital, Vancouver, B.C.

Radiographer Available

English radiographer, female, age 27, senior radiographer at British Hospital and a fellow of the Society of Radiographers, would like a position in Canada within the next few months. Kindley apply to Central Office for further details.

ERRATUM — MARCH 1950 issue

The CONCLUSIONS which appeared on page 7 should have appeared as the translation of those on page 3.

EDITORIAL

AVENIR DE LA RADIOLOGIE MEDICALE

En considérant les innombrables progrès déjà réalisés par le radiodiagnostic et la radiothérapie, on peut être tenté de croire que leurs nouvelles possibilités restent très limitées.

Pourtant, la découverte de nouvelles substances opaques à élimination sélective ouvrira encore bien des avenues au radiodiagnostic. Des organes et des régions actuellement inexplorables par les radiations, le deviendront. Des cancers au début, difficilement décelables aujourd'hui, seront facilement décelées avec les perfectionnements de l'appareillage, de la technique et de l'émulsion des films.

Il se peut que dans quelques années, les radiologistes aient à mettre en évidence des modifications structurales des tissus que nos procédés d'investigation actuels ne peuvent nous révéler. Déjà, certains radiologistes font des études historadiagraphiques et d'autres emploient des isotopes radioactifs pour établir le diagnostic différentiel de certaines affections. De récentes incursions dans le domaine de la physiologie avec les radioisotopes, laissent entrevoir des horizons nouveaux sur la pathologie et bouleversent même nos conceptions sur la pathogénie de certaines maladies. Anatomie—Histologie—Physiologie—Pathologie générale—Histopathologie—et Physique des Radiations devront occuper une place de plus en plus importante dans la formation des futurs radiologistes. Mais en retour ces derniers, à cause de leurs connaissances étendues et variées, seront des consultants très recherchés pour l'établissement d'un diagnostic adéquat et précis.

Si rapide que soit le développement du Radiodiagnostic, il ne dépassera vraisemblablement pas c*elui de la Radiothérapie*. Car les appareils de Rayons X à très hauts voltages (10-20-30-40 millions de volts), le Betatron, les neutrons de la fission nucléaire et les isotopes radioactifs se présentent déjà à nous avec un avenir rempli de promesses.

En atteignant sélectivement les centres vitaux des cellules, les radiations électromagnétiques émises par les très hauts voltages, auront des effets encore insoupçonnés. Quant aux radiations corpusculaires, (particules bêta et neutrons), elles nous laissent espérer une action destructrice sur les tumeurs profondes, sans endommager les tissus superficiels. Bien que les radioisotopes soient moins prometteurs en thérapeutique qu'en diagnostic, il seront quand même des armes puissantes, capables de produire des résultats que ni la médecine, ni la chirurgie ne pourront donner. Et qui sait, si l'arsenal radiothérapique ne s'enrichira pas des rayons cosmiques et des radiations protoniques ?

Tous ces nouveaux moyens de guérir, exigeront du radiothérapeute des connaissances physiques et biologiques très approfondies, en même temps qu'une formation médicale étendue; mais elles lui vaudront une place de choix parmi ses collègues médecins et chirurgiens.

Le champ qui s'ouvre à la Radiologie est très vaste, et il sera bien difficile à un radiologiste de mener de front la pratique du radiodiagnostic et celle de la radiothérapie.

Si la Radiologie continue à progresser à pas de géant, elle nous offrira bien des surprises d'ici quelques années. Et son importance deviendra telle qu'elle sera reconnue par les facultés de médecine comme une discipline majeure, à l'égal de la médecine et de la chirurgie qu'elle complétera très largement en même temps qu'elle fournira une aide précieuse à toutes les spécialités médicales et chirurgicales sans exception.